



富相科技股份有限公司

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PART NO : GC1602P8SHN1B(LM1180SGR)
FOR MESSRS : _____

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Accepted by : _____

Proposed by : 
Date : 08,22,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY
84.10.21	3	3.3 MECHANICAL DATA (5) CHARACTER SIZE -----2.96W*4.86H mm —————▶2.96W*5.56H mm
86.09.03	ALL	ADDRESS CHANGED
87.04.20	ALL	PAGES CHANGED (CHANGED TO COMMON BOARD)
88.12.02	8	PAGE CHANGED
2002,02,19	ALL 04 05 09	CHANGED ADDRESS , FAX , TEL & COMPANY NAME , LOGO 4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS. SHOCK STORAGE 490.0m/s ² (50G)→ 49.0m/s ² (5G) 5.ELECTRICAL CHARACTERISTICS. RECOMMENDED LCD DRIVING VOLTAGE TYP. 4.6 →(4.7) , 4.4→4.2 , 4.2→(3.7) ADD TOLERANCE : ±0.01mm
2002,02,21	04 08	NOTE (3) 95%→90% 7. DIMENSION OUTLINE. 7.8±0.5→4.8±0.5
2002,08,08	ALL	CHANGE PART NO.LM1180SGR→GC1602R0SHN1B
2002,08,21	ALL	CHANGE PART NO. GC1602R0SHN1B→GC1602P8SHN1B

3. GENERAL SPECIFICATIONS AND MECHANICAL DATA.

3.1 GENERAL SPECIFICATIONS.

PLEASE REFER TO :

”CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-001)”.

3.2 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS.

3.3 MECHANICAL DATA

- (1) NUMBER OF CHARACTER ----- 16CH*2 LINES
- (2) MODULE SIZE ----- 84.0W*44.0H*9.5T (MAX) mm
- (3) VIEWING AREA ----- 63.5W*15.8H mm
- (4) CHARACTER PATTERN ----- 5*7DOTS +CURSOR
- (5) CHARACTER SIZE ----- 2.96W*5.56Hmm
- (6) CHARACTER PITCH ----- 3.55W*5.94Hmm
- (7) DOT SIZE -----0.56W*0.66H mm
- (8) DOT PITCH ----- 0.60W*0.70Hmm
- (9) LCD TYPE ----- STN, GRAY, REFLECTIVE
60'CLOCK

4. ABSOLUTE MAXIMUM RATINGS.

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	——	6.0	V	
POWER SUPPLY FOR LCD DRIVING VOLTAGE	VDD-VO	——	6.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	——	——	100	V	NOTE (1)

NOTE(1) : TEST METHOD AND CONDITIONS AFTER CHARGING UP 200PF
CAPACITOR BY STATED VOLTAGE , THE CAPACITOR IS CONNECTED
WITH INTERFACE PINS OF THE MODULE.

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	0℃	50℃	-20℃	60℃	NOTE (2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	— —	4.9 m/s ² (0.5G)	— —	19.6 m/s ² (2G)	10~300HZ XYZ DIRECTIONS 1 Hr.EACH
SHOCK	— —	29.4 m/s ² (3G)	— —	49.0 m/s ² (5G)	10 mSEC XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -20℃ : 48HR MAX.
60℃ : 168HR MAX.

NOTE(3) : Ta ≤ 40℃ :90% RH MAX.
Ta > 40℃ : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE
HUMIDITY OF 90%RH AT 40℃ .

5. ELECTRICAL CHARACTERISTICS.

Ta = 25°C

VDD = 5.0±10%

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
INPUT VOLTAGE (H LEVEL)	VIH	— — — —	2.2	— —	— —	V
INPUT VOLTAGE (L LEVEL)	VIL	— — — —	— —	— —	0.6	V
OUTPUT VOLTAGE (H LEVEL)	VOH	-I0H = 0.2mA	2.4	— —	— —	V
OUTPUT VOLTAGE (L LEVEL)	VOL	I0L = 1.2mA	— —	— —	0.4	V
POWER SUPPELY CURRENT (LOGIC)	IDD	VDD = 5.0 V	— —	1.0	3.0	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE(1)	VDD-VO DUTY=1/16 φ=10°	Ta = 0 °C	— —	(4.7)	— —	V
		Ta = 25 °C	— —	4.2	— —	V
		Ta = 50 °C	— —	(3.7)	— —	V

NOTE(1) : RECOMMENDED LCD DRIVING VOLTAGE

MAY FLUCTUATE ABOUT ± 0.5V BY EACH MODULE.

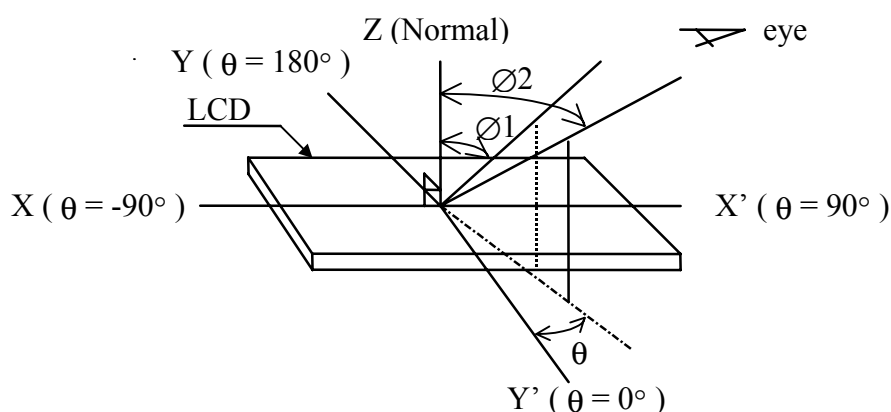
6. OPTICAL CHARACTERISTICS.

Ta = 25°C

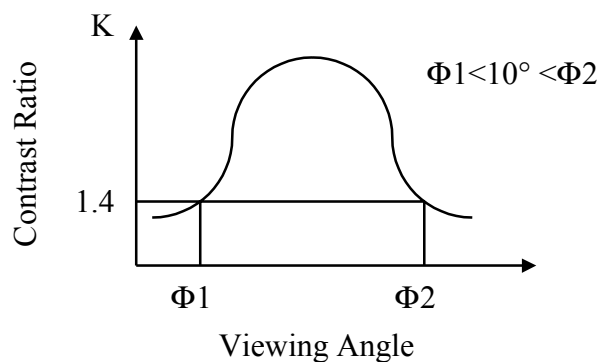
VDD = 5.0V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	$\Phi 2 - \Phi 1$	K = 1.4	----	40	----	deg.	
CONTRAST RATIO	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	----	2	----	----	
RESPONSE TIME	tr(rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	----	250	400	ms	
	tf(fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	----	350	450	ms	

NOTE(1) : DEFINITION OF θ AND Φ



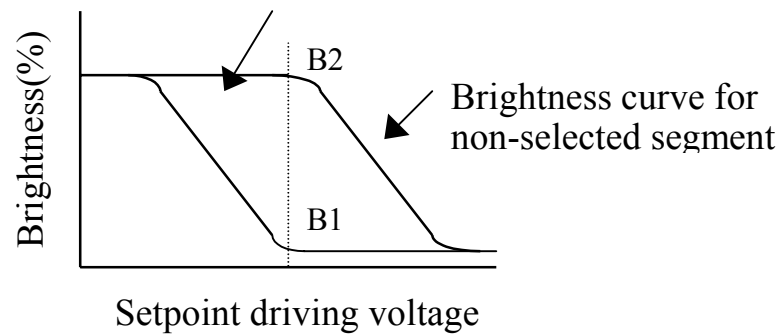
NOTE(2) : DEFINITION OF VIEWING ANGLE $\Phi 1$ AND $\Phi 2$



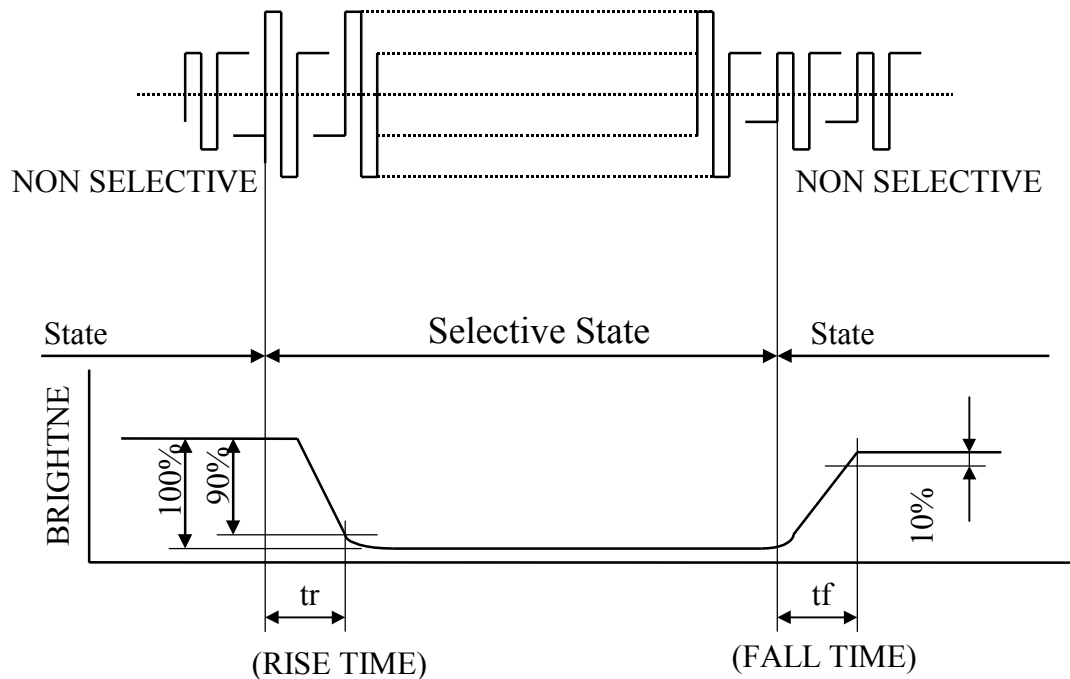
NOTE (3) : DEFINITION OF CONTRAST“K”.

$$K = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$

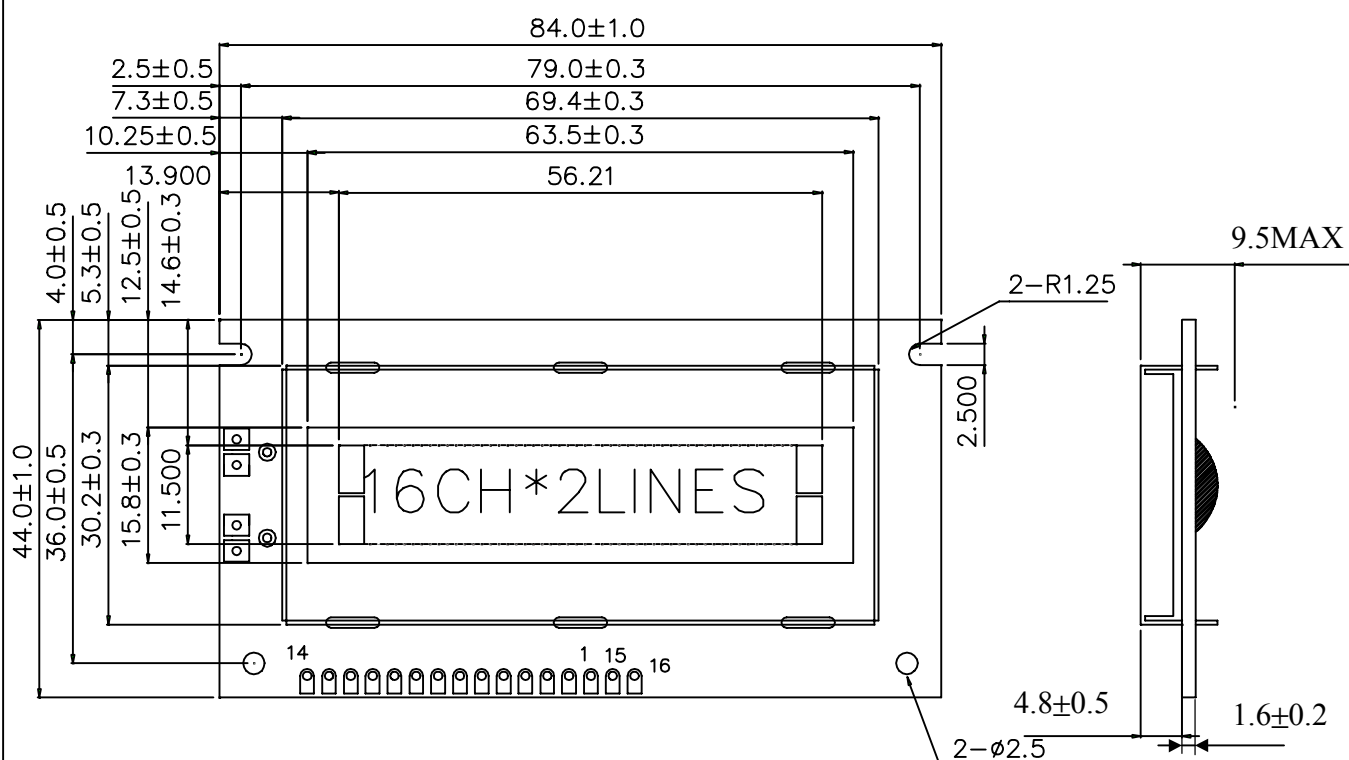
Brightness curve for selected segment



NOTE(4) : DEFINITION OF OPTICAL RESPONSE.



7. DIMENSION OUTLINE.



↑↑ 6 O'CLOCK

NO SPECIFIED TOLERANCE:±0.3

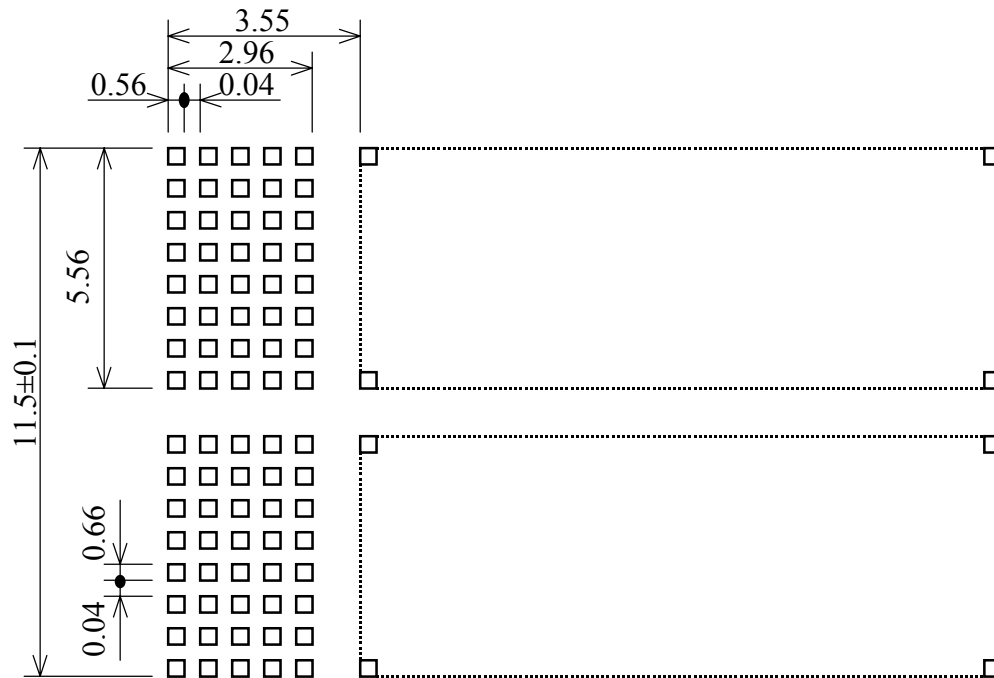
SCALE : NTS

UNIT : mm

INTERFACE PIN CONNECTION.

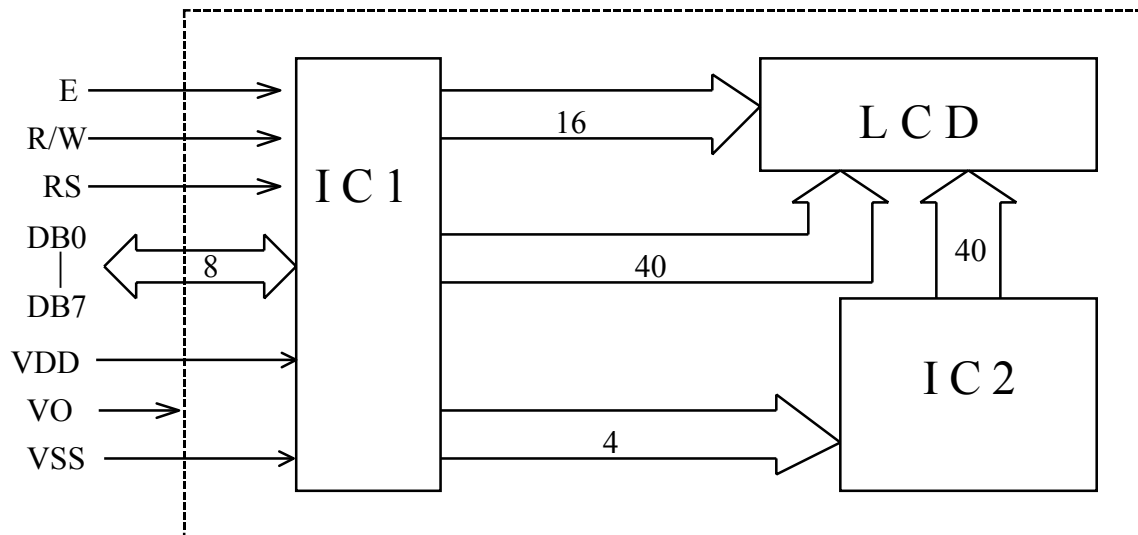
PIN NO	1	2	3	4	5	6	7	8	9	10
SYMBOL	VSS	VDD	VO	RS	R/W	E	DB0	DB1	DB2	DB3
PIN NO	11	12	13	14	15	16				
SYMBOL	DB4	DB5	DB6	DB7	NC					

7.1 DETAIL DRAWING OF MATRIX PATTERN.



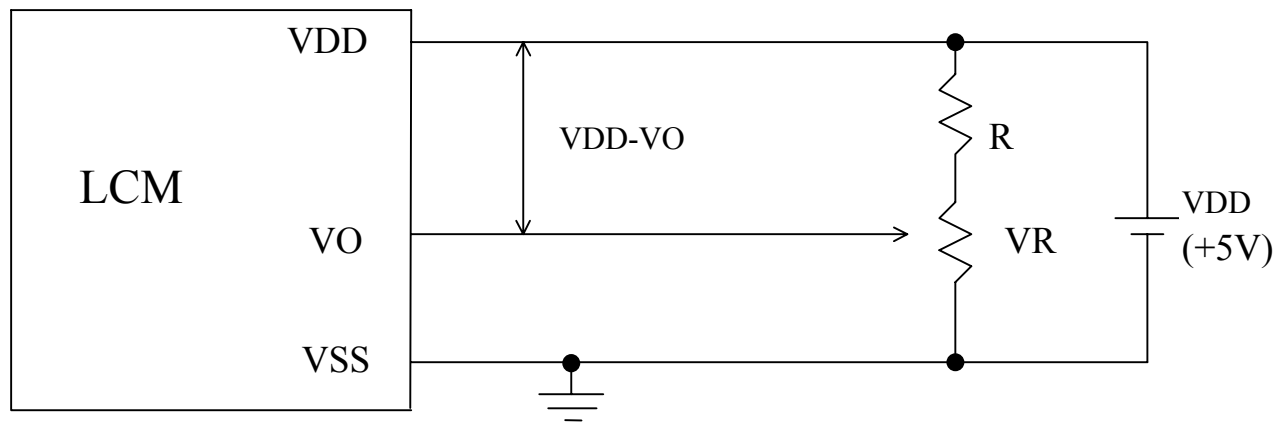
NOT SPECIFIED TOLERANCE: $\pm 0.01\text{mm}$

7.2 BLOCK DIAGRAM.



8. POWER SUPPLY.

8.1 POWER SUPPLY FOR LCM.



VDD-VO : LCD DRIVING VOLTAGE

VR : $10\text{K}\Omega \sim 20\text{K}\Omega$

RECOMMEND RESISTOR R: $1\text{K}\Omega$